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Students' Attitudes towards Craft and Technology in the Context of Finnish and Slovenian Comprehensive Schools

Ossi Autio, Janez Jamsek & Milan Gaberšek

The research is based on a comparative study of craft and technology education curriculums and students' attitudes towards craft and technology in Finland and Slovenia. The study was undertaken by the Helsinki University and University of Ljubljana during years 2013-2015. A literature review was completed, in order to examine and compare the craft and technology education curriculums in Finland and Slovenia. In addition, a quantitative survey was subsequently distributed to 505 school students in Finland and Slovenia. The questionnaire consisted of 14 questions, which aimed to ascertain students' attitudes towards craft and technology. The survey showed substantial differences in students' attitudes towards craft and technology education in the two countries: these differences may be explained by differences in the national curriculums, the different pedagogical traditions and cultural differences in the field of technology. However, for deeper understanding, the quantitative findings need to be examined further with different research methods.

Keywords: Craft and Technology education, Attitudes towards technology, National curriculum

Introduction

The attitude is a broad concept with different interpretations and definitions (Albarracin, Zanna, Johnson & Kumkala, 2005). The most common definition is: "Attitudes are psychological tendencies that are expressed by evaluating a particular entity with some degree of favour" (Eagly & Chaiken, 1993). According to de Klerk Wolters (1989) attitude towards technology is "a certain feeling with reference to technology, based on a certain concept of technology, and that carries with it an intention to behaviour in favour of or against technology" Dyrenfurth (1990) and Layton (1994) referred to attitudes in technology education using the concept of 'technological will'. According to these authors, technology is determined and guided by human emotions, motivation, values and personal qualities. Thus, in the future the development of technology is dependent on the students' will to take part in lessons and on their technological decisions. Whether or not the attitude towards technology contains the cognitive dimension is often discussed and technological knowledge can, however, be correlated with attitude (Ardies, De Maeyer & van Keulen, 2012).

In the educational research, cognitive objectives have historically been emphasized over instruments that measure affective domain (Krathwohl, Bloom & Bertram, 1964). Some researchers (Arffman & Brunell, 1983; Bjerrum, Nielsen & Rudberg, 1989) assume that personality characteristics, such as motivation, develop relatively slowly and are visible over long periods of time. However, new evidence challenges this statement. Because of the rapid development, it is thought that affective behaviors undergo sudden transformations especially in the field of technology (Popham, 1994). In addition, if students have a positive attitude toward a subject, for example technology, then students will have more of an interest in that subject. Hence, if one of the educational goals of technology education is technological literacy, then students acting positively toward technology would be more likely to develop in technological literacy through technology education (Bame, Dugger, de Vries & McBee, 1993).

The research on students' attitudes toward technology has a long history. PATT is the first instrument specifically made for this purpose. This instrument was first conducted in the Netherlands and since 1984 researchers have been using it in several different formats and a number of different instruments have been made for measuring an attitude in the field of technology (Garmire & Pearson, 2006). One of the first studies was Raat and de Vries (1986) which investigated the attitudes of middle school students toward technology.

The project titled Pupils' Attitudes Toward Technology (PATT) studied students' attitudes toward technology and their understanding of technological concepts. Their research concluded that: (a) students had only a vague concept of technology, (b) the relationship of technology and physics was unclear to students, and (c) girls are less interested in technology and see it as less important. The difference between boys and girls was noticed and since that it is reported during recent years in several researches (Allsop 1986; Grant & Harding, 1987; Johnsson & Murphy 1986; Streumer, 1988; Autio, 1997; Autio, Thorsteinsson & Olafsson, 2012; Autio & Soobik, 2013).

Later, the PATT questionnaire was revised for use in the United States (PATT-USA) and the questionnaire was tested and validated in seven states (Bame, Dugger, de Vries & McBee, 1993). The PATT-USA study indicated that: students are interested in technology and they are strongly aware of the importance of technology. However, boys are more interested in technology than girls. Moreover, students think that technology is a field for both girls and boys, but girls are more convinced that technology is a field for both genders and that there is a positive influence of a parents' technological profession on the students' attitude. Students' concept of technology became more accurate with increasing age and students who had taken industrial arts/technology education classes had more positive attitudes on all sub-scales.

Mostly, students' attitudes in technology education has been used to assess student attitudes before the curriculum development. However, attitude measurements have not been used to assess changes in attitude as the result of a treatment such as participation in a technology education classes. It is just assumed that students who have a positive experience in a technology education program will develop a positive attitude toward technology and the pursuit of technological careers, and would therefore be more interested in studying about technology. Thus, students should become more technologically literate (Boser, Palmer & Daugherty, 1998). This premise is grounded in research from the affective domain that indicates that students who exhibit a positive attitude toward a subject are more likely to actively engage in learning during and after instruction (Popham, 1994).

However, regardless of gender, participation in technology education programs did not significantly change students' interest in technology. The content in these programs ranged from a traditional industrial arts project to very contemporary exemplars of technology education curriculum. Specifically, in the industrial arts approach students made a simple note pad holder using wood, plastic, and metal. The integrated approach examined waste management and the environment. In the modular approach students explored units on transportation, communication, and structures. Students in the problem-solving approach worked through a simulation on community planning. It was surprising and almost ironic that the only approach to show a positive change in attitudes was the industrial arts approach. Female students consistently thought technology to be less interesting than male students did. The higher mean scores of females on the item - Technology Is Difficult also indicated that girls thought technology was more difficult to use and to understand than did boys. Conversely, female students indicated that they perceived an understanding of technology to be of equal importance for males and females. Overcoming societal norms seems to be a huge challenge and it appears that participation in a nine-week technology education program did not help much in these perceptions (Boser, Palmer & Daugherty, 1998).

As cultural differences exist across the world, it would be wise not to generalize the results. In South Africa van Rensburg, Ankiewicz and Myburgh (1999) found out that there were no significant differences regarding the gender attitudes. In addition, *t*-test indicated that in two of the most important value issues towards Technology girls' views towards Technology Education were more positive. This could influence Technology Education and more positive outcomes from girls could be expected. The influence of Technology Education could probably be optimized by maximum exposure of girls to Technology Education. The fact that boys may view technology as less positive may indicate that technological jobs could be viewed as blue collar jobs and academic education is not respected by all citizens. If Technology Education is to survive it must be influenced in a more positive direction and low achievement of both genders is to be eliminated. Problem identification

should be at grassroots level, specific to the needs of that specific society. Inputs should lead to the development of relevant modules, materials and curricula. It can further be envisaged that within the context of this research project, there might be a need for the application of qualitative strategies (e.g. ethnographic) to investigate.

To contribute an increased understanding of the PATT results Svenningsson, Hulten and Hallström (2015) examined six 14-year-old Swedish students and their results in the PATT survey. These six students completed a Swedish version of the PATT measurements and three weeks later had a 15-minute semi-structured interview. The main idea was to understand the students' attitudes and interest in technology in more detail. During the interviews, they concentrated in three main categories; *Interest*, *Career* and *Gender*. Even though most of the interviewees used interest as a synonym to enjoyment, this lack of distinction did not seem to affect the survey result. An urge for a technological career equaled working as an engineer or architect among these interviewees. Those who did not want to pursue such a career mentioned this career, rather vaguely as technician. There seem to be an impact from other sources than school, which create this difference in career aspirations. The interviewees also let us know that they tend to agree that boys might be more capable with technology related tasks, meaning that there are more boys than girls that are capable. To conclude, the interviews made with students in this study did not point to any validity problems of the questionnaire, the students seems to understand most of the questions in the intended way and how to position their answers on a Likert-scale.

From the quantitative point of view one of the main problems has been that most of the research is done with 10 to 16-year-old students and the original instrument with 76 items seemed to be too complicated and time consuming. Suggestions have been made to create a shorter instrument. The idea was to investigate the possibilities of using a 'subset of scales' with a maximum of five items for each scale. Such an instrument yields many advantages of easier apply and less time needed from teachers using it in the classroom (Ardies, De Maeyer & van Keulen, 2012). Their instrument consists of six subscales and 24 items of attitudes towards technology. Six subscales are: Career Aspirations, Interest in Technology, Tediousness of Technology, Positive Perception of the Effects of Technology, Perception of Difficulty and Perception of Technology as a Subject for Boys and Girls. Although, the instrument used in this current research was developed already in 1993, the factors were named: interest in technology, the consequences of technology, difficulty of technology, role pattern, technological career and technology as school subject. Hence, it seems to be congruence with previous and later developed PATT instruments.

In the following sections, the authors will briefly describe Finnish and Slovenian Craft and Technology education, at first in the curriculum level. Later on the authors will try to highlight the attitudes towards Craft and Technology to ascertain whether there are any differences in practical level between these countries. Finally in the empirical part of the study the authors try to find out if there are any differences in students' attitudes towards craft and technology in different items of the questionnaire. The research questions were:

1. Are there differences in students' attitudes towards craft and technology in Finland and Slovenia?
2. What are the most positive and negative items in students' attitudes?

Craft and Technology Education in Finland and Slovenia

The general aim of Finnish craft and technology education is to increase students' self-esteem by developing their skills through enjoyable craft activities; it also aims to increase students' understanding of the various manufacturing processes and the use of different materials in craft. Furthermore, the subject aims to encourage students to make their own decisions in designing, allowing them to assess their ideas and products. Students' practical work is product orientated and based on experimentation, in accordance with the development of their personality. The role of the teacher is to guide students' work in a systematic manner. They must encourage pupils' independence, the growth of their creative skills through problem-based learning and the development of technical literacy. In addition, gender issues are important throughout the whole curriculum (Framework Curriculum Guidelines, 2004).

Furthermore, Framework Curriculum Guidelines (2004) outlines the meaning of technology in terms of a clearly defined, context-based approach. Daily life, society, industry and the environment as well as human dependence on technology are pointed out. Students are expected to be familiar with new technology, including ICT, how it is developed and what kind of influence it has. One of the reasons outlined in the curriculum for studying technology is that it helps students to discuss and think about the related ethical, moral and value issues.

On the other hand, several goals set for the technology education were already presented in the general part of the National Framework Curriculum of 1994. At present, both Science and Craft education are quite far from the goals set for technology education. In school Physics and Chemistry, theoretical constructs easily overshadow practical applications of various physical phenomena, and connections between these two remain superficial. Likewise, in Craft and Technology, practical applications may overshadow the very basic physical phenomena and laws that lie behind the operation of any machine used. Furthermore, for example, if concepts and processes, like electric circuits and energy production, are met during Science or Craft and Technology lessons, they are seldom discussed in broad contexts such as environmental, ecological, and social perspectives (Alamäki, 1999, Autio, 2016).

Slovenian primary school technological education is compulsory for pupils aged from 9 -13 years. D&T curriculum is based on standards and was last time reformed in 2011. Students are directed in carrying out activities such as design, preparation, technological processing, product testing, assessment, and product presentation as well as its price determination (economics) and evaluation (also environmental). Students discover and learn simple engineering and technological problems and find ways to solve them by using simple tools. The general objectives stimulate students to develop their abilities at designing and finding new solutions where creative linking of science and technological knowledge with practice is encouraged. Teachers are recommended (by the curriculum) to implement experiential, problem and project based learning to gain students active work through data and information collection, exploration, experimentation, guided work and reflection. An important innovation in curricular reform since 1999 are technological activity days. They are distributed throughout the nine-year education in an average 4 days per year. These days allow student consolidation and integration of the knowledge obtained from the subject and cross curricular. Students work inclusion is more active and motivational, and therefore encourages students' curiosity and creativity. The same reform also reduced amount of handicraft and practical work in the obligatory subject and introduced elective subjects (woodworking, plastic working, metalworking, electrical engineering, electronics in robotics, robotics in engineering, technical drawing and physics & engineering projects) which are implemented in the 7th-9th grade and are not compulsory to select. Execution of the elective subject is rather poor so the majority of the students only gain design and technology basic knowledge and the more contemporary themes are left out (Falkin, 2011).

Thus, as seen above, there are many similarities between the national curriculums in Finland and Slovenia; however, there are also some differences. During last twenty years there has been an active discussion about

the role of technology education in Finnish compulsory education. However, the optimal solution how technology education should be taught in practice proceeds with great difficulty. Among public servants, office holders and teachers as well as researchers or teacher educators a great consensus has not been found. Others think that technology education should be design-process based with the emphasis on wood, metal and textile work – which is supposed to be “multimaterial” craft as is suggested in the latest National Curriculum (2014). Others feel technology Education should be a more theoretical "classroom-type" school subject. Moreover, the basic concepts and the relationship between Craft and Technology are not clear for all parties, although Parikka (1998) has presented a logical etymological foundation of technology presented in Figure 1.

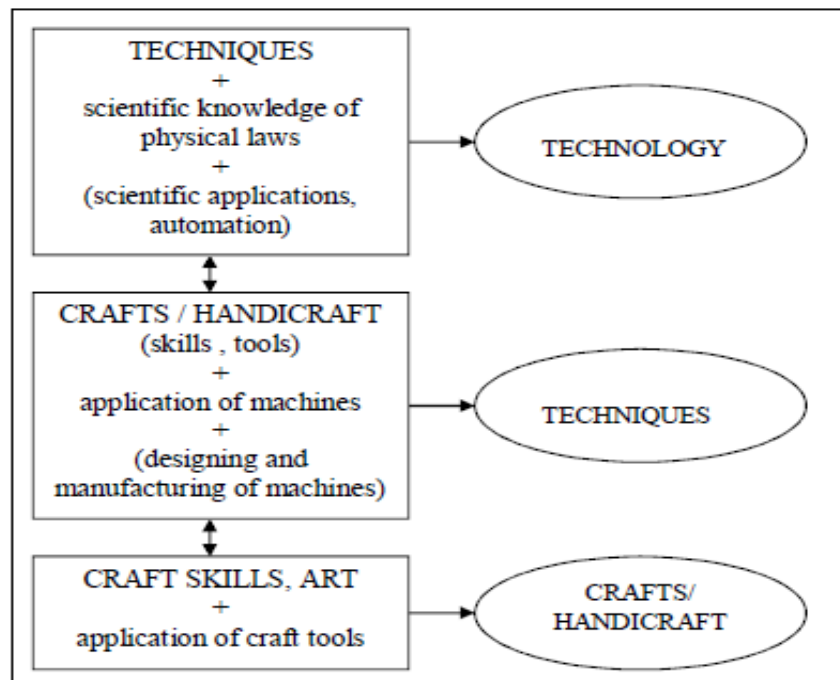


Figure 1. Etymological foundation of technology (Parikka, 1998)

Methods

The main aim of the empirical part of this research was to answer the question: Are there differences in students' attitudes towards technology in Finland and Slovenia? In this kind of research which is aimed at relatively large group of students; the test instrument should be easy to use and suitable for large-scale research. Likert scales are by far the most used in attitude measurements. We can assume that this is mostly due to practical reasons. The Likert scales can easily be constructed and depending on the nature and structure of the test they usually offer an acceptable reliability and validity. As self-report instruments, they are quite simple to use and they are not time consuming. To find out whether there were any differences between the two countries; we employed a two tailed t-test with the same variance, as we had no hypothesis of the development in attitudes towards technology based on the previous research. Instead, boys and girls were compared with one tailed t-test as there is plenty of research evidence available about the difference.

In order to evaluate students' attitudes towards technology in Finland, a questionnaire was devised, consisting of 14 statements. For each Likert-type item, there were five options, from 'Strongly Disagree' (= 1) to 'Strongly Agree' (= 5). The questionnaire was based on the PATT instrument (Pupils Attitudes Towards Technology), which were designed and validated by Raat & de Vries (1986) and van de Velde (1992). Reliability of the questionnaire, was 0.85 in the year 1993 and 0.84 in the year 2014. The amount of test participants was in Finland 317 and 188 in Slovenia. The age of the student-respondents was 11-13 years.

Results

Some differences in students' attitudes towards technology were found between Finland and Slovenia. The average response in our Likert-style (1-5) questionnaire to 14 items was 3.37 among Finnish 11-year-old girls and 3.61 among Slovenian 11-year-old girls. A statistically significant difference was found between younger and older girls whereas the average response among Finnish 13-year-old girls was 3.14 and among Slovenian 13-year-old girls 2.73 ($p=0.003$). Among boys test group the average response in 11-year-old boys' category was in Finland 3.78 and in Slovenia 3.81. The difference between younger and older boys was not statistically significant whereas the average response among Finnish 13-year-old boys was 3.72 and among Slovenian 13-year-old boys 3.58. The average values and standard deviations are presented in Table 1.

Table 1. The average values and standard deviations of 11- and 13-year-old girls and boys in the measurement of attitudes towards technology

Test group	Finland		Slovenia		p-value
	average	std.	average	std.	
11-year-old girls	3,37	0.56	3,61	0.46	$p=0.02$
11-year-old boys	3,78	0.48	3,81	0.57	$p=0.85$
13-year-old girls	3,14	0.52	2,73	0.55	$p=0.003$
13-year-old boys	3,72	0.56	3,58	0.57	$p=0.22$

The difference between boys' and girls' attitudes was not a surprise as it is reported during recent years in several researches (Allsop 1986; Grant & Harding, 1987; Johnsson & Murphy 1986; Streumer, 1988; Autio, 1997; Autio, Thorsteinsson & Olafsson, 2012; Autio & Soobik, 2013). In more detail, the average scores for each statement are listed in the Table 2 below.

Table 2. Average values for each statement, in the measurement of students' attitudes towards craft and technology

	1. I am interested in technology and related phenomena	2. I spend much time on technology related hobbies	3. Technology related magazines and articles are interesting	4. To understand technological phenomena is beneficial in the future	5. To understand technological phenomena needs a special talent	6. Both boys and girls may understand technological phenomena	7. The mankind has rather benefited than sustained from the development of technology
Boys 11y Slovenia	3,86	2,95	3,57	4,03	3,89	3,85	4,28
Boys 11y Finland	4,34	3,07	2,84	3,97	3,61	4,31	4,27
Boys 13y Slovenia	3,36	2,74	3,05	3,59	3,77	4,31	4,28
Boys 13y Finland	4,07	2,96	2,95	3,76	3,46	4,4	4,15
Girls 11y Slovenia	3,57	2,70	2,95	3,73	3,76	4,38	4,11
Girls 11y Finland	3,43	2,72	2,34	3,45	3,53	4,57	3,84
Girls 13y Slovenia	2,42	1,61	1,76	2,91	3,27	3,45	3,58
Girls 13y Finland	2,97	2,53	2,35	3,09	3,04	4,53	3,89

	8. In the future I would like to choose a profession related to technology	9. My parents have a lot of technology related hobbies	10. The atmosphere in technology education lessons is pleasant	11. Technology education considerably develop my manual skills	12. Technology education considerably develop my logical thinking	13. I have been successful in technology education lessons	14. Technology education lessons will be beneficial for me in the future
Boys 11y Slovenia	2,90	3,27	3,71	4,71	4,33	3,97	4,08
Boys 11y Finland	3,29	3,03	4,28	4,29	3,86	3,82	3,94
Boys 13y Slovenia	3,13	3,51	3,08	3,90	3,77	3,69	4,00
Boys 13y Finland	3,18	2,98	4,28	4,21	3,82	3,99	3,81
Girls 11y Slovenia	2,11	3,16	3,65	4,54	4,05	3,89	3,89
Girls 11y Finland	2,4	3,07	3,53	3,81	3,59	3,47	3,47
Girls 13y Slovenia	1,52	2,39	2,58	3,21	3,21	3,39	2,91
Girls 13y Finland	2,23	2,84	3,47	3,6	3,29	3,27	2,89

Differences in students' attitudes towards technology

In more detail, some differences were found between Finland and Slovenia. Significant statistical difference ($p < 0.001$) between the two countries was found in the statement: *I am interested in technology and the phenomena related to it*. The difference was seen between both 11-year-old and 13-year-old boys test groups and among 13-year-old girls whereas Finnish students had more positive attitude. Instead, in 11-year-old girls test group Slovenian girls showed more interest in technology and phenomena related to it than Finnish girls. As mentioned earlier several differences in attitudes were found between boys and girls. The highest statistical difference ($p < 0.001$) between boys and girls was found as well in the statement: *I am interested in engineering and the phenomena related to it*. The highest value 4.34 was found among Finnish 11-year-old boys, followed by Finnish 13-year-old boys 4.07. The lowest value 2.42 was scored by 13-year-old Slovenian girls. From statistical point of view, this statement had the highest correlation (0.76, $p < 0.001$) to the average of other statements. In the factor analysis, this statement explained 57.7 % of the total variance. Average values in the statement: *I am interested in technology and phenomena related to it* are presented in Figure 1.

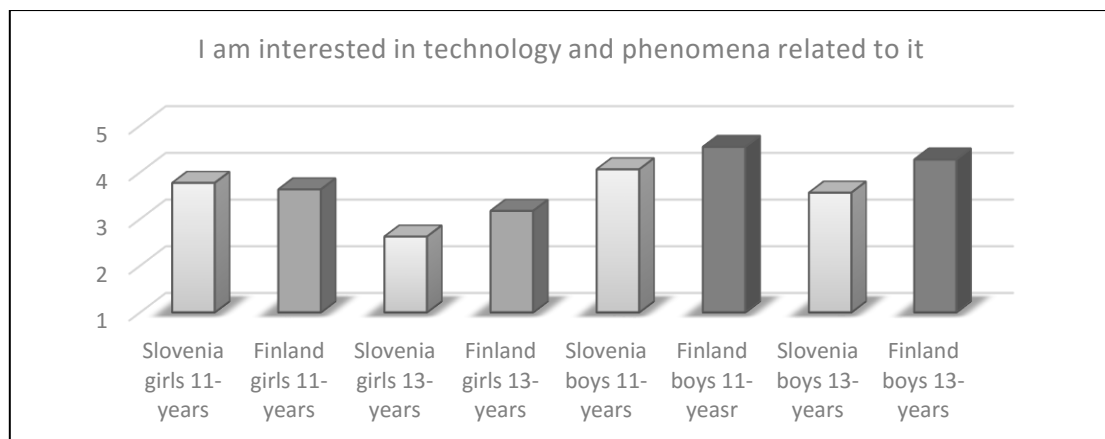


Figure 1: Shows the average values in statement: *I am interested in technology and phenomena related to it*

Relatively high scores from Finnish boys corroborates with previous studies: both boys and girls are attracted to technology education because they enjoy working with their hands and like the independence and creativity provided by these classes (Silverman & Pritchard, 1996). Students who typically enroll in technology education are attracted to the types of projects they will be engaged in (Weber & Custer, 2005). Why that not

happening in Slovenia and among Finnish girls needs to be researched further. In addition, this could be connected to another statement with relatively high difference between the two countries: *In the future I would like to choose a profession related to technology* (Slovenian girls 2.11/1.52, Finnish girls 2.40/2.23). Among boys test groups the difference was smaller (Finnish boys 3.29/3.18 and Slovenian boys 2.90/3.13).

Most positive and negative elements in attitudes towards technology

Analyzing the results more precisely it can be seen that the highest values were given in the statement: *Both boys and girls may understand technology-related phenomena*. (Finnish boys 4.31/4.40, Slovenian boys 3.85/4.31, Finnish girls 4.57/4.53 and Slovenia girls 4.38/3.45). This is a clear sign that gender issues are important in both Finnish and Slovenian technology education. Both boys and girls are aware of gender equality; however 13-year-old Slovenian girls' relatively much lower response is alarming and needs to be researched and explained further. Average values in the statement: Both boys and girls may understand technology-related phenomena are presented in Figure 2.

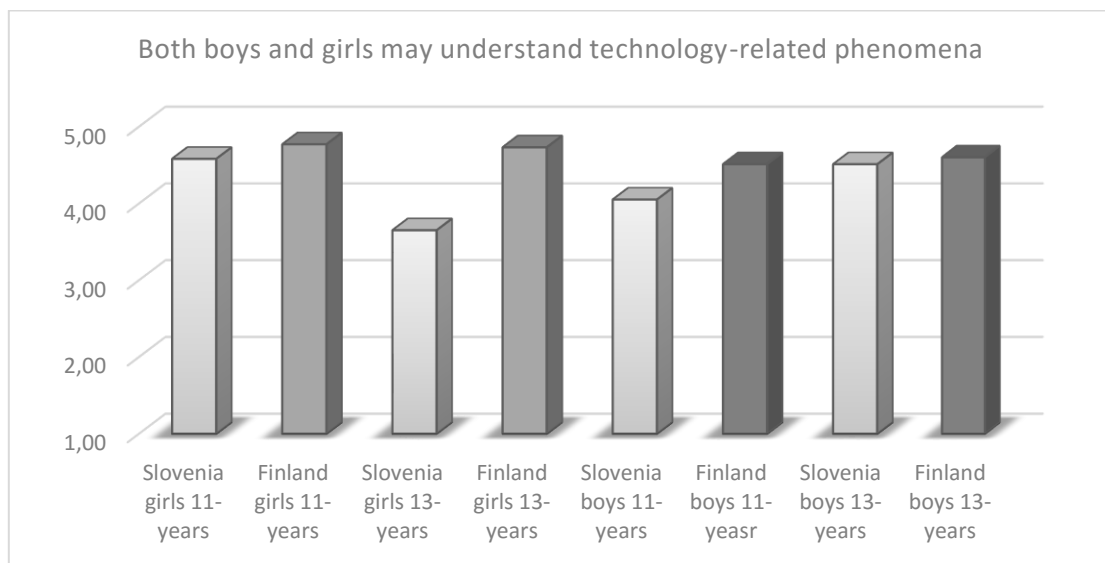


Figure 2: Shows the average values in statement: Both boys and girls may understand technology-related phenomena

Relatively high scores were also found in statements: *The mankind has rather benefited than sustained damage from the development of technology* (Finnish boys 4.27/4.15, Slovenian boys 4.28/4.28 and Slovenian 11-year-old girls 4.11). *Technology Education lessons considerably develop my manual skills* (Finnish boys 4.29/4.21, Slovenian boys 4.71/3.90, Slovenian and Finnish 11-year-old girls 4.54/3.81). *The atmosphere in Technology Education lessons is pleasant* (Finnish boys 4.28/4.28).

The lowest value was found in the statement: *In the future I would like to choose a profession related to technology* (Slovenian girls 2.11/1.52, Finnish girls 2.40/2.23). This is most probably connected with Eccles (2007) who states that males will receive more support for developing a strong interest in physical science and engineering from their parents, teachers and peers than females. In addition, it is absolutely the case that young people will see more examples of males engaged in these occupations than females. However, relatively low values were also found among boys (Finnish boys 3.29/3.18 and Slovenian boys 2.90/3.13). Average values in statement: In the future I would like to choose a specialty or a profession related to engineering is presented in Figure 3.

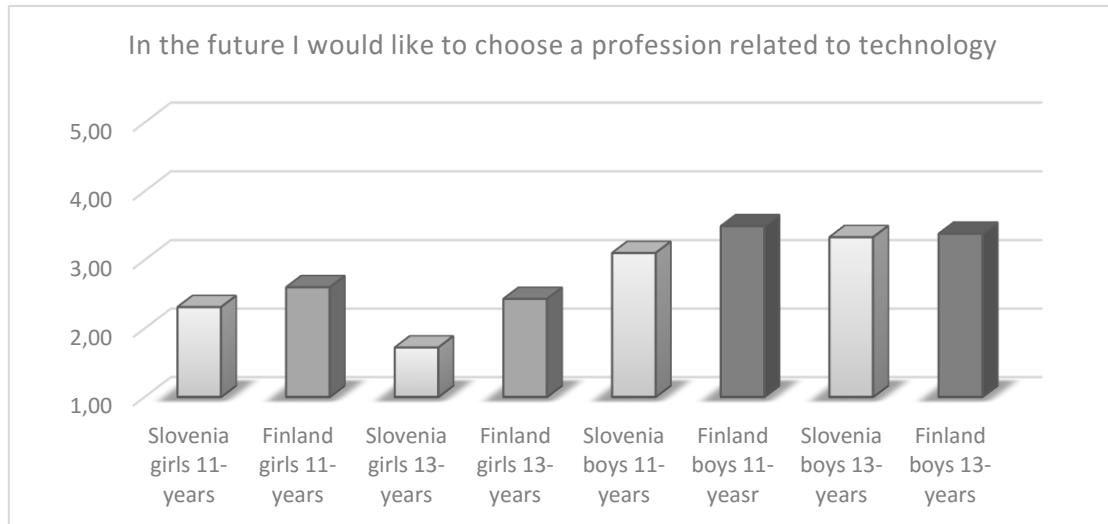


Figure 3: Shows the average values in statement: In the future I would like to choose a profession related to technology

Another low value when compared with the other statements was found in the statement: *I spend a lot of time with technology-related hobbies* (Slovenian girls 2.70/1.61, Finnish girls 2.72/2.53, Slovenian boys 2.95/2.74 and Finnish boys 3.07/2.96) and *Technology-related magazines, and articles are interesting* (Slovenian girls 2.95/1.76, Finnish girls 2.34/2.35, Slovenian boys 3.57/3.05 and Finnish boys 2.84/2.85).

Discussion

The critical side of this research is that it is based on self-reports and measures only students' attitude, not their absolute technological will which is shaped and guided by human emotions, motivation, values, personal qualities and real life choices regarding technology. In addition, the attitude is just one part of a larger concept, which is 'technological competence' However, attitude is a crucial part of the competence as it has an important role on building technological knowledge and technological skills in real life situations (Autio, 2011). Moreover, to achieve a relevant comparison between the two countries, the concept of technology in different cultural backgrounds and in different school systems must be considered. In quantitative research, validity is usually open to various interpretations. However, Svenningsson, Hulten and Hallström (2015) study where six 14-year-old Swedish students and their results in the PATT survey were researched with qualitative method did not find any validity problems of the questionnaire.

The main problem in Finland is that the amount of craft lessons is still the same as twenty years ago although there are much more technology-related phenomena to be taught to all students. What's more, Craft education is nowadays divided into technologically based Technical craft and artistically based Textile craft. As a consequence of this girls have more technologically based lessons than twenty years ago, unfortunately boys have much less than they had twenty years ago. This may be seen in the results of this study as well. This trend is expected to have even more effect on technology education in the future as multimaterial craft will be emphasized over technology.

Furthermore, Finnish students' attitudes towards technology are still at a significantly lower level than in Iceland and Estonia, which have relatively different curriculum in technology education (Autio, Thorsteinsson & Olafsson, 2012; Autio & Soobik, 2013). Moreover, most of the boys (88.2%) still want to choose only technical craft studies and the girls (62.9%) want to concentrate on textiles (Autio, 2013). It indicates that the curriculum which includes two different compulsory Craft subjects: Technical craft and Textile craft is a suitable setup especially for younger Finnish girls. Hence, it can be concluded that an ideal solution in technology education has not been found. What's more, the justifiable question of other point of view in

equality arouses: are all students without any regard to sex given an opportunity to choose study groups based on their wishes and interests, which allows them to study in greater detail the subject that they are really interested in?

In Slovenian technology education everything seems to be reasonably well among 11-year-old students whereas girls perform even better attitudes in some items than Finnish younger girls. In addition the attitudes of younger boys are in practice in the same level as among Finnish younger boys. However, a critical question is what happens to older Slovenian girls – can the older students really study the phenomena that they are really interested in? Moreover, is the curriculum for older students too theoretical (electrical engineering, electronics in robotics, robotics in engineering, technical drawing and physics & engineering projects) as the selection of the elective subject is rather poor and the majority of the students only gain design and technology basic knowledge. How can they benefit from the fact that especially girls are interested in technological everyday solutions rather than technological details as reported in several other researches (Eccles, 2009; Mitts, 2008; Weber & Custer, 2005; Wender, 2004). However, it is a fact that there are plenty of different interesting technological everyday solutions (mobile phones, games consoles, tablets, etc.) available for all children which were not even made-up twenty years ago?

The most promising results were found in the statement: *Both boys and girls may understand engineering-related phenomena*. This is probably due to Finnish curriculum that has put large emphasis on gender equity since 1970. It seems to be a fact that both Finnish girls and boys are aware of the gender equity. The same phenomena is noticeable also in Slovenia. In other hand, it is a paradox that only a few girls are willing to challenge stereotypes about non-traditional careers for women, as it could be conducted from responses to the statement: *In the future I would like to choose a profession related to technology*. In addition, even though there has been much development, only a few girls seemed to have technological hobbies or had a great interest in technological articles. The main concern should be that the same phenomena has been reported already in the early PATT measurements by Bame, Dugger, de Vries and McBee (1993).

Another interesting phenomenon is that at least younger girls in both countries seem to feel the atmosphere in technology education at least moderately enjoyable and they mostly agree that technology education influences their manual skills. However, they do not think technology education is beneficial for them in the future, as can be conducted from the statement: *Technology Education lessons will be beneficial in the future*. Moreover, there is still a significant difference between boys and girls in attitudes towards technology in general. This gender-based segregation and falling recruitment for scientific and technological studies is as a result of common phenomena in all the Nordic countries (Sjöberg, 2002). However, it is interesting that the phenomenon is also noticeable in Slovenia. The problem of the inequality in the field of technology seems to be far more complicated than we are used to think and it is not just technology education that is responsible to resolve such a complex problem. The problem of inequality should belong to the whole society.

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